

Fig. 1

	1	60
Hpv11-e1	MADDSGTENEGSGCTGWMVEAIVEHTTGTQISEDEEEVEEDSGYDMVDFIDDRHITQNS	
Hpv6a-e1	MADDSGTENEGSGCTGWMVEAIVQHPTGTQISDDEDEEVEEDSGYDMVDFIDDSNITHNS	
6b-e1	MADDSGTENEGSGCTGWMVEAIVQHPTGTQISDDEDEEVEEDSGYDMVDFIDDSNITHNS	
	61	120
Hpv11-e1	VEAQALFNRQEADAHYATVQDLKRKYLGSPPYVSPISNVANAVESEISPRLDAIKLTTQPK	
Hpv6a-e1	LEAQALFNRQEADTHYATVQDLKRKYLGSPPYVSPINTIAEAVESEISPRLDAIKLTRQPK	
6b-e1	LEAQALFNRQEADTHYATVQDLKRKYLGSPPYVSPINTIAEAVESEISPRLDAIKLTRQPK	
	121	180
Hpv11-e1	KVKRRLFETRELTDSGYGYSEVEA..ATQVEKHGDPENGGDGQERDTGRDIEGEGVEHRE	
Hpv6a-e1	KVKRRLFQTRELTDSGYGYSEVEAGTGTQVEKHGVPENGGDGQEKDTGRDIEG..EEHTE	
6b-e1	KVKRRLFQTRELTDSGYGYSEVEAGTGTQVEKHGVPENGGDGQEKDTGRDIEG..EEHTE	
	181	240
Hpv11-e1	AEAVDDSTREHADTSGILELLKCKDIRSTLHGKFKDCFGLSFVDLIRPFKSDRTTCADWV	
Hpv6a-e1	AEAPTNSVREHAGTAGILELLKCKDLRAALLGKFKECFGLSFIDLIRPFKSDKTTCADWV	
6b-e1	AEAPTNSVREHAGTAGILELLKCKDLRAALLGKFKECFGLSFIDLIRPFKSDKTTCLDWV	
	241	300
Hpv11-e1	VAGFGIHHSIADAFQKLIPLSLYAHIQWLTNAGMVLLVLIRFKVNKSRTVARTLGTL	
Hpv6a-e1	VAGFGIHHSISEAFQKLIPLSLYAHIQWLTNAGMVLLVLVRFKVNKSRTVARTLATL	
6b-e1	VAGFGIHHSISEAFQKLIPLSLYAHIQWLTNAGMVLLVLLRFKVNKSRTVARTLATL	
	301	360
Hpv11-e1	LNIPENHMLIEPPKIQSGVRALYWFGTGISNASTVIGEAPWITRQTVIEHSLADSQFKL	
Hpv6a-e1	LNIPDNQMLIEPPKIQSGVAALYWFGTGISNASTVIGEAPWITRQTVIEHGLADSQFKL	
6b-e1	LNIPENQMLIEPPKIQSGVAALYWFGTGISNASTVIGEAPWITRQTVIEHGLADSQFKL	
	361	420
Hpv11-e1	TEMVQWAYDNDICEESEIAFEYAQRGDFDSNARAFLNSNMQAKYVKDCAIMCRHYKHAEM	
Hpv6a-e1	TEMVQWAYDNDICEESEIAFEYAQRGDFDSNARAFLNSNMQAKYVKDCATMCRHYKHAEM	
6b-e1	TEMVQWAYDNDICEESEIAFEYAQRGDFDSNARAFLNSNMQAKYVKDCATMCRHYKHAEM	
	421	480
Hpv11-e1	KKMSIKQWIKYRGTKVDSVGNWKPIVQFLRHQNIEFIPFLSKLKLWLHGTPKKNCIAIVG	
Hpv6a-e1	RKMSIKQWIKHRGSKIIEGTGNWKPIVQFLRHQNIEFIPFLSKFKLWLHGTPKKNCIAIVG	
6b-e1	RKMSIKQWIKHRGSKIIEGTGNWKPIVQFLRHQNIEFIPFLTKFKLWLHGTPKKNCIAIVG	
	481	540
Hpv11-e1	PPDTGKSCFCMSLIKFLGGTVISYVNSCSHFWLQPLTDAKVALLDATQPCWITYMDTYMR	
Hpv6a-e1	PPDTGKSYFCMSLISFLGGTVISHVNSSSHFWLQPLVDAKVALLDATQPCWIYMDTYMR	
6b-e1	PPDTGKSYFCMSLISFLGGTVISHVNSSSHFWLQPLVDAKVALLDATQPCWIYMDTYMR	
	541	600
Hpv11-e1	NLLDGNPMSIDRKHRALTLIKCPPLLVTSNIDISKEEKYKYLHSRVTTFTFPNPFPPDRN	
Hpv6a-e1	NLLDGNPMSIDRKHKALTLIKCPPLLVTSNIDITKEEKYKYLHTRVTTFTFPNPFPPDRN	
6b-e1	NLLDGNPMSIDRKHKALTLIKCPPLLVTSNIDITKEDKYKYLHTRVTTFTFPNPFPPDRN	
	601	651
Hpv11-e1	GNAVYELSDANWKCFFERLSSSLDIEDSEDEEDGSNSQAFRCVPGSVVRTL [SEQ.ID NO.1]	
Hpv6a-e1	GNAVYELSNANWKCFFERLSSSLDIQDSEDEEDGSNSQAFRCVPGTVVRTL [SEQ.ID NO.2]	
6b-e1	GNAVYELSNNTNWKCFERLSSSLDIQDSEDEEDGSNSQAFRCVPGTVVRTL [SEQ.ID NO.3]	

Fig. 2

	1	60
6b-e1	MADDSGTENEGSGCTGWFMEIVQHPTGTQISDDEDEEVEDSGYDMVDFIDDSNITHNS	
6b-e1 mut	MADDSGTENEGSGCTGWFMEIVQHPTGTQISDDEDEEVEDSGYDMVDFIDDSNITHNS	
	61	120
6b-e1	LEAQALFNRQEADTHYATVQDL KR KYLGSPYVSPINTIAEAVESEISPRLDAIKLTRQPK	
6b-e1 mut	LEAQALFNRQEADTHYATVQDL GG KYLGSPYVSPINTIAEAVESEISPRLDAIKLTRQPK	
	121	180
6b-e1	KVKRRLFQTRELTDSGYGYSEVEAGTGTQVEKHGVPENGGDGQEKDTGRDIEGEEHTEAE	
6b-e1 mut	KVKRRLFQTRELTDSGYGYSEVEAGTGTQVEKHGVPENGGDGQEKDTGRDIEGEEHTEAE	
	181	240
6b-e1	APTNSVREHAGTAGILELLKCKDLRAALLGKFKECFGLSFIDLIRPFKSDKTTCLDWVVA	
6b-e1 mut	APTNSVREHAGTAGILELLKCKDLRAALLGKFKECFGLSFIDLIRPFKSDKTTCLDWVVA	
	241	300
6b-e1	GFGIHHSISEAFQKLIIEPLSLYAHIQWLTNAWGMVLLVLLRFKVNKSIRSTVARTLATLLN	
6b-e1 mut	GFGIHHSISEAFQKLIIEPLSLYAHIQWLTNAWGMVLLVLLRFKVNKSIRSTVARTLATLLN	
	301	360
6b-e1	IPENQMLIEPPKIQSGVAALYWFRGTGISNASTVIGEAPIEWITRQTVIEHGLADSQFKLTE	
6b-e1 mut	IPENQMLIEPPKIQSGVAALYWFRGTGISNASTVIGEAPIEWITRQTVIEHGLADSQFKLTE	
	361	420
6b-e1	MVQWAYDNDICEESEIAFEYAQRGDFDSNARAFLNSNMQAKYVKDCATMCRHYKHAEMRK	
6b-e1 mut	MVQWAYDNDICEESEIAFEYAQRGDFDSNARAFLNSNMQAKYVKDCATMCRHYKHAEMRK	
	421	480
6b-e1	MSIKQWIKHRGSKIEGTGNWKPIVQFLRHQNIIEFIPFLTKEFKLWLHGTPKKNCIAIVGPP	
6b-e1 mut	MSIKQWIKHRGSKIEGTGNWKPIVQFLRHQNIIEFIPFLTKEFKLWLHGTPKKNCIAIVGPP	
	481	540
6b-e1	DT G KSIFYCMSLISFLGGTVISHVNSSSHFWLQPLVDAKVALLDATQPCWIYMDTYMRNL	
6b-e1 mut	DT D KSIFYCMSLISFLGGTVISHVNSSSHFWLQPLVDAKVALLDATQPCWIYMDTYMRNL	
	541	600
6b-e1	LDGNPMSIDRKHKALTLIKCPPLLVTSNIDITKEDKYKYLHTRVTTFTFPNPFPFDRNGN	
6b-e1 mut	LDGNPMSIDRKHKALTLIKCPPLLVTSNIDITKEDKYKYLHTRVTTFTFPNPFPFDRNGN	
	601	649
6b-e1	AVYELSNTNWKCFERLSSSLDIQDSEDEEDGSNSQAFRCVPGTVVRTL	[SEQ.ID NO.4]
6b-e1 mut	AVYELSNTNWKCFERLSSSLDIQDSEDEEDGSNSQAFRCVPGTVVRTL	[SEQ.ID NO.5]

Fig. 3

	1	60
Hpv-11e2	MEAI AKRLDACQDQLLELYEENSIDIHKHIMHWKCIRLESVLLHKAKQMGLSHIGLQVVP	
Hpv6a-e2	MEAI AKRLDACQEQLLELYEENSTDLNKHVLHWKCMRHESVLLYKAKQMGLSHIGMQVVP	
Hpv6b-e2	MEAI AKRLDACQEQLLELYEENSTD LHKHVLHWKCMRHESVLLYKAKQMGLSHIGMQVVP	
	61	120
Hpv-11e2	PLTVSETKGHNAIEMQMHLES LAKTOYGVEPWTLQDTSYEMWLT PPKRCFKKQGN TVEVK	
Hpv6a-e2	PLKVSEAKGHNAIEMQMHLES LLKTEYSMEPWTLQETS YEMWQT PPKRCFKKRGKTVEVK	
Hpv6b-e2	PLKVSEAKGHNAIEMQMHLES LLRTEYSMEPWTLQETS YEMWQT PPKRCFKKRGKTVEVK	
	121	180
Hpv-11e2	FDGCEDNVMEYVVWTHIYLQDNDSWVKVTSSVDAKGIYYTCGQFKTYVNFNKEAQKYGS	
Hpv6a-e2	FDGCANNTMDYVVWTDVYVQDTSWVKVHSMVDAKGIYYTCGQFKTYVNFVKEAEKYGS	
Hpv6b-e2	FDGCANNTMDYVVWTDVYVQDNTWVKVHSMVDAKGIYYTCGQFKTYVNFVKEAEKYGS	
	181	240
Hpv-11e2	TNHWEVCYGSTVICSPASVSSTVREVSIAEPTTYTPAQTTAPTVSACTTEDGVSAPPRKR	
Hpv6a-e2	TKQWEVCYGSTVICSPASVSSTTQEVSIPESTTYTPAQTS TP.VSSSTQEDAVQTPPRKR	
Hpv6b-e2	TKHWEVCYGSTVICSPASVSSTTQEVSIPESTTYTPAQTS TL.VSSSTKEDAVQTPPRKR	
	241	300
Hpv-11e2	ARGPSTN..NTLCVANIRSVDSTINNIVTDNYNKHQRRNNCHSAATPIVQLQGDSNCLKC	
Hpv6a-e2	ARGVQQSPCNALCVAHIGPVDSGNHNLI TNNHDQHQRNNNSNSSATPIVQFQGESNCLKC	
Hpv6b-e2	ARGVQQSPCNALCVAHIGPVDSGNHNLI TNNHDQHQRNNNSNSSATPIVQFQGESNCLKC	
	301	360
Hpv-11e2	FRYRLNDKYKHLFELASSTWHWASPEAPHKNAIVTLTYSSEEQRQQFLNSVKIPPTIRHK	
Hpv6a-e2	FRYRLNDKHRHFLDLISSTWHWASPKAPHKHAIVTVTYHSEEQRQQFLNVVKIPPTIRHK	
Hpv6b-e2	FRYRLNDRHRHFLDLISSTWHWASSKAPHKHAIVTVTYDSEEQRQQFLDVVKIPPTISHK	
	361	369
Hpv-11e2	VGFM SLHLL [SEQ. ID NO. 6]	
Hpv6a-e2	LGFM SLHLL [SEQ. ID NO. 7]	
Hpv6b-e2	LGFM SLHLL [SEQ. ID NO. 8]	

Fig. 4a

	1	60
Hpv-11e2-comut	MEAI AKRLDACQDQLLELYEENSIDIHKKHIMHWKCIRLESVLLHKAKQMGLSHIGLQVVP	
Hpv-11e2-mut	MEAI AKRLDACQDQLLELYEENSIDIHKKHIMHWKCIRLESVLLHKAKQMGLSHIGLQVVP	
Hpv-11e2-wt	MEAI AKRLDACQDQLLELYEENSIDIHKKHIMHWKCIRLESVLLHKAKQMGLSHIGLQVVP	
	61	120
Hpv-11e2-comut	PLTVSETKGNHNAIEMQMHLLESLAKTQYGVEPWTQLQDTSYEMWLTPPKRCFAKQGNNTVEVK	
Hpv-11e2-mut	PLTVSETKGNHNAIEMQMHLLESLAKTQYGVEPWTQLQDTSYEMWLTPPKRCFAKQGNNTVEVK	
Hpv-11e2-wt	PLTVSETKGNHNAIEMQMHLLESLAKTQYGVEPWTQLQDTSYEMWLTPPKRCFAKQGNNTVEVK	
	121	180
Hpv-11e2-comut	FDGCEDNVMEYVVWTHIYLQDNDSSWVKVTSSVDAKGIYYTCGQFKTYVNFNKEAQKYGS	
Hpv-11e2-mut	FDGCEDNVMEYVVWTHIYLQDNDSSWVKVTSSVDAKGIYYTCGQFKTYVNFNKEAQKYGS	
Hpv-11e2-wt	FDGCEDNVMEYVVWTHIYLQDNDSSWVKVTSSVDAKGIYYTCGQFKTYVNFNKEAQKYGS	
	181	240
Hpv-11e2-comut	TNHWECYGSTVICSPASVSSTVREVSI AEPTTYTPAQTTAPTVSACTTEDGVSAPPRKR	
Hpv-11e2-mut	TNHWECYGSTVICSPASVSSTVREVSI AEPTTYTPAQTTAPTVSACTTEDGVSAPPRKR	
Hpv-11e2-wt	TNHWECYGSTVICSPASVSSTVREVSI AEPTTYTPAQTTAPTVSACTTEDGVSAPPRKR	
	241	300
Hpv-11e2-comut	ARGPSTNNTLCVANIRSVDSTINNIVTDNYNKHQRRNNCHSAATPIVQLQGDSNCLKCFR	
Hpv-11e2-mut	ARGPSTNNTLCVANIRSVDSTINNIVTDNYNKHQRRNNCHSAATPIVQLQGDSNCLKCFR	
Hpv-11e2-wt	ARGPSTNNTLCVANIRSVDSTINNIVTDNYNKHQRRNNCHSAATPIVQLQGDSNCLKCFR	
	301	360
Hpv-11e2-comut	YRLNDKYKHLFELASSTWHWASPEAPHKNAIVTLTYSSEEQRQQFLNSVKIPPTIRHKVG	
Hpv-11e2-mut	YRLNDKYKHLFELASSTWHWASPEAPHKNAIVTLTYSSEEQRQQFLNSVKIPPTIRHKVG	
Hpv-11e2-wt	YRLNDKYKHLFELASSTWHWASPEAPHKNAIVTLTYSSEEQRQQFLNSVKIPPTIRHKVG	
	361	367
Hpv-11e2-comut	FMSLHLL [SEQ. ID NO. 9]	
Hpv-11e2-mut	FMSLHLL [SEQ. ID NO. 10]	
Hpv-11e2-wt	FMSLHLL [SEQ. ID NO. 11]	

Fig. 4b

	1		60
Hpv-6be2-wt	MEAI	AKRLDACQEQLLELYEENSTD	LHKHVLHWKCMRHESVLLYKAKQMGLSHIGMQVVP
Hpv-6be2-mut	MEAI	AKRLDACQEQLLELYEENSTD	LHKHVLHWKCMRHESVLLYKAKQMGLSHIGMQVVP
	61		120
Hpv-6be2-wt	PLKVSEAKGHNAIEMQMHLESLLRTEYSMEPWT	LQETSYEMWQT	PPKRCF K KRGKTVEVK
Hpv-6be2-mut	PLKVSEAKGHNAIEMQMHLESLLRTEYSMEPWT	LQETSYEMWQT	PPKRCF A KRGKTVEVK
	121		180
Hpv-6be2-wt	FDGCANNTMDYVVWTDVYVQDNDTWVKVHSMVDA	KGIYYTCGQFKTYYVNFVKEAEKYGS	
Hpv-6be2-mut	FDGCANNTMDYVVWTDVYVQDNDTWVKVHSMVDA	KGIYYTCGQFKTYYVNFVKEAEKYGS	
	181		240
Hpv-6be2-wt	TKHWEVCYGSTVICSPASVSSTTQEV	SIPESTTYTPAQTSTL.VSSSTKEDAVQTPPRKR	
Hpv-6be2-mut	TKHWEVCYGSTVICSPASVSSTTQEV	SIPESTTYTPAQTSTL.VSSSTKEDAVQTPPRKR	
	241		300
Hpv-6be2-wt	ARGVQQSPCNALCVAHIGPVD	SGNHNLTNNHDQHQRNNSNSSATPIVQFQGESNCLKC	
Hpv-6be2-mut	ARGVQQSPCNALCVAHIGPVD	SGNHNLTNNHDQHQRNNSNSSATPIVQFQGESNCLKC	
	301		360
Hpv-6be2-wt	FRYRLNDRHRHFLDLISSTWHWASSKAPHKHAIVTVTYDSEEQRQQFLDVVKIPPTISHK		
Hpv-6be2-mut	FRYRLNDRHRHFLDLISSTWHWASSKAPHKHAIVTVTYDSEEQRQQFLDVVKIPPTISHK		
	361	369	
Hpv-6be2-wt	LGFM	SLHLL [SEQ. ID NO. 12]	
Hpv-6be2-mut	LGFM	SLHLL [SEQ. ID NO. 13]	

Fig. 5a

```

1
HPV6be1-comut GCGGCCGCCATGGCAGACGATTCCGGTACTGAGAACGAAGGTTCTGGTTGTACCGGTTGG 60

61
HPV6be1-comut TTCATGGTTGAAGCAATCGTTCAGCATCCGACTGGTACCCAGATCTCCGATGACGAAGAC 120

121
HPV6be1-comut GAAGAAGTTGAAGATTCTGGTTACGACATGGTTGACTTCATCGATGACTCCAACATCACT 180

181
HPV6be1-comut CATAACTCTCTGGAAGCACAGGCTCTGTTTAACCGCCAGGAAGCTGATACCCATTACGCT 240

241
HPV6be1-comut ACTGTTCAGGACCTGGGAGGCAAATATCTGGGCTCTCCGTACGTTTCCCGATCAACACT 300

301
HPV6be1-comut ATCGCAGAAGCAGTTGAGTCTGAAATCTCCCCGCGCCTGGACGCTATCAAACGACTCGT 360

361
HPV6be1-comut CAGCCGAAGAAGGTTAAACGTCGTCTGTTCCAGACTCGTGAACTGACCGACTCCGGTTAC 420

421
HPV6be1-comut GGTATAGCGAAGTTGAGGCTGGCACC GG CACCCAGGTTGAAAAACACGGTGTACCGGAA 480

481
HPV6be1-comut AACGGCGGCGACGGTCAGGAAAAGGACACCGGCCGCGACATCGAGGGTGAGGAACACACC 540

541
HPV6be1-comut GAAGCTGAAGCTCCGACTAACTCTGTTTCGTGAACACGCAGGTACTGCGGGTATCCTGGAA 600

601
HPV6be1-comut CTGCTGAAATGCAAAGACCTGCGCGCGGCTCTGCTGGGCAAATTCAAAGAATGCTTCGGC 660

661
HPV6be1-comut CTGTCTTTCATTGACCTGATCCGTCCGTTTAAGTCTGACAAAACCTACCTGTCTGGACTGG 720

721
HPV6be1-comut GTTGTAGCAGGCTTCGGCATCCACCACTCTATCTCTGAAGCATTCCAGAAACTGATCGAG 780

781
HPV6be1-comut CCGCTGTCTCTGTACGCGCACATCCAGTGGCTGACTAACGCTTGGGGTATGGTTCTGCTG 840

841
HPV6be1-comut GTACTGCTGCGCTTTAAAGTAAACAAATCTCGTTCCACTGTTGCTCGTACTCTGGCTACC 900

901
HPV6be1-comut CTGCTGAACATCCCGGAGAACCAGATGCTGATCGAACCGCCGAAAATCCAGTCTGGTGTA 960

961
HPV6be1-comut GCTGCACTGTACTGGTTTCGTACTGGCATCTCTAACGCTAGCACTGTTATCGGTGAAGCA 1020

1021
HPV6be1-comut CCGGAATGGATCACTCGTCAGACCGTTATCGAACACGGTCTGGCAGATTCTCAGTTCAAA 1080

1081
HPV6be1-comut CTGACTGAAATGGTTCAGTGGGCATACGACAACGACATCTGCGAGGAATCTGAAATTGCG 1140
```

Fig. 5b

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1141
HPV6bel-comut TTCGAATACGCTCAGCGTGGCGACTTCGACTCCAACGCTCGTGCTTTCCTGAACAGCAAC 1200

1201
HPV6bel-comut ATGCAGGCTAAATACGTAAAAGACTGCGCTACCATGTGCCGTCACTACAAACACGCGGAA 1260

1261
HPV6bel-comut ATGCGTAAAATGTCTATCAAACAGTGGATCAAGCACCGCGGTTCTAAAATCGAAGGTACC 1320

1321
HPV6bel-comut GGTAAGTGGAAACCGATCGTTCAGTTCCTGCGCCATCAGAACATCGAATTCATCCCGTTC 1380

1381
HPV6bel-comut CTGACCAAATTCAAGCTGTGGCTGCACGGTACCCCGAAAAAACTGCATCGCTATCGTA 1440

1441
HPV6bel-comut GGTCCACCGGACACTGACAAGTCTTACTTCTGTATGTCCCTGATCTCTTTCCTGGGCGGC 1500

1501
HPV6bel-comut ACTGTAATCTCTCACGTAACTCTTCTCCATTTCTGGCTGCAGCCACTGGTAGACGCG 1560

1561
HPV6bel-comut AAAGTAGCTCTGCTGGACGACGCGACCCAGCCGTGCTGGATCTACATGGATACTTACATG 1620

1621
HPV6bel-comut CGCAACCTGCTGGACGGTAACCCGATGTCTATCGACCGTAAACACAAAGCGCTGACTCTG 1680

1681
HPV6bel-comut ATCAAGTGCCCGCCGCTGCTGGTAACTTCTAACATCGACATCACCAAGGAAGATAAATAC 1740

1741
HPV6bel-comut AAGTACCTGCATACCCGTGTTACTACCTTTACTTTCCCGAACCCGTTCCCGTTTGATCGT 1800

1801
HPV6bel-comut AACGGTAACGCTGTTTACGAACTGTCCAACACTAACTGGAAATGCTTCTTCGAGCGTCTG 1860

1861
HPV6bel-comut TCTTCCTCCCTGGACATCCAGGACTCTGAAGATGAAGAAGATGGTTCTAACTCTCAGGCT 1920

1921
HPV6bel-comut TTCCGTTGTGTTCCGGGTACTGTTGTTTCGTACTCTGTGAGGATCC''. [SEQ.ID NO. 14] 1968
```

Fig. 6

```

1
Hpvl1e2-comut 1'GCGGCCGCCATGGAAGCCATCGCGAAGAGGCTCGACGCCTGCCAGGACCAGCTGCTCG 60

61
Hpvl1e2-comut AGCTGTACGAGGAGAACAGCATTGACATCCATAAGCACATCATGCACTGGAAGTGCATTC 120

121
Hpvl1e2-comut GCCTGGAGAGCGTGCTGTTGCACAAGGCCAAGCAGATGGGCCTGTCCCACATAGGCCTTC 180

181
Hpvl1e2-comut AGGTGGTCCCCCTCTGACCGTGTGAGAGACAAAGGGCCATAACGCAATCGAGATGCAGA 240

241
Hpvl1e2-comut TGCACCTCGAGTCGCTGGCGAAAACACAGTACGGCGTGGAGCCATGGACCCTGCAGGACA 300

301
Hpvl1e2-comut CCTCGTACGAAATGTGGCTGACCCACCTAAGCGATGCTTCGCCAAACAGGGCAACACAG 360

361
Hpvl1e2-comut TGGAGGTGAAGTTCGACGGCTGTGAGGATAACGTTATGGAGTATGTCGTGTGGACGCACA 420

421
Hpvl1e2-comut TCTATCTGCAGGACAACGACAGTTGGGTGAAGGTGACCAGCTCCGTGGACGCGAAGGGCA 480

481
Hpvl1e2-comut TCTACTATACCTGTGGGCAGTTTAAACCTACTATGTGAACTTCAACAAAGAGGGCCCAA 540

541
Hpvl1e2-comut AGTATGGCTCCACCAACCACTGGGAGGTCTGCTATGGGAGCACGGTGATTTGCTCTCCCG 600

601
Hpvl1e2-comut CCAGCGTGTCTAGCACTGTGCGCGAGGTGAGCATTGCCGAGCCGACCACGTACACCCCTG 660

661
Hpvl1e2-comut CCCAGACGACCGCTCCGACCGTGTCTGCTTGTACTACCGAGGACGGCGTGAGCGCTCCAC 720

721
Hpvl1e2-comut CCAGGAAGCGTGCGAGGGGGCCCAAGCACCAACAACACCCTCTGTGTGGCGAACATTGCA 780

781
Hpvl1e2-comut GCGTCGACAGTACCATCAATAACATCGTGACGGATAACTATAACAAGCACCAGAGGCGTA 840

841
Hpvl1e2-comut ACAACTGTCACTCTGCCGCAACCCCCATCGTGACGCTCCAGGGAGACAGCAATTGCCTTA 900

901
Hpvl1e2-comut AGTGCTTCCGCTATCGCCTCAACGACAAGTACAAGCACCTCTTTGAGCTCGCCTCGTCGA 960

961
Hpvl1e2-comut CGTGGCACTGGGCCTCACCCGAGGCACCTCACAAGAAGCCATCGTCACTCTCACTTACT 1020

1021
Hpvl1e2-comut CCAGTGAGGAGCAGAGACAGCAGTTTCTGAACAGCGTGAAGATCCCACCGACGATCCGTC 1080

1081
Hpvl1e2-comut ATAAGGTCGGCTTCATGTCACTGCATCTCCTGTGAGGATCC' 1123 [SEQ. ID NO. 15]
```


Fig. 7

WRG7313plc

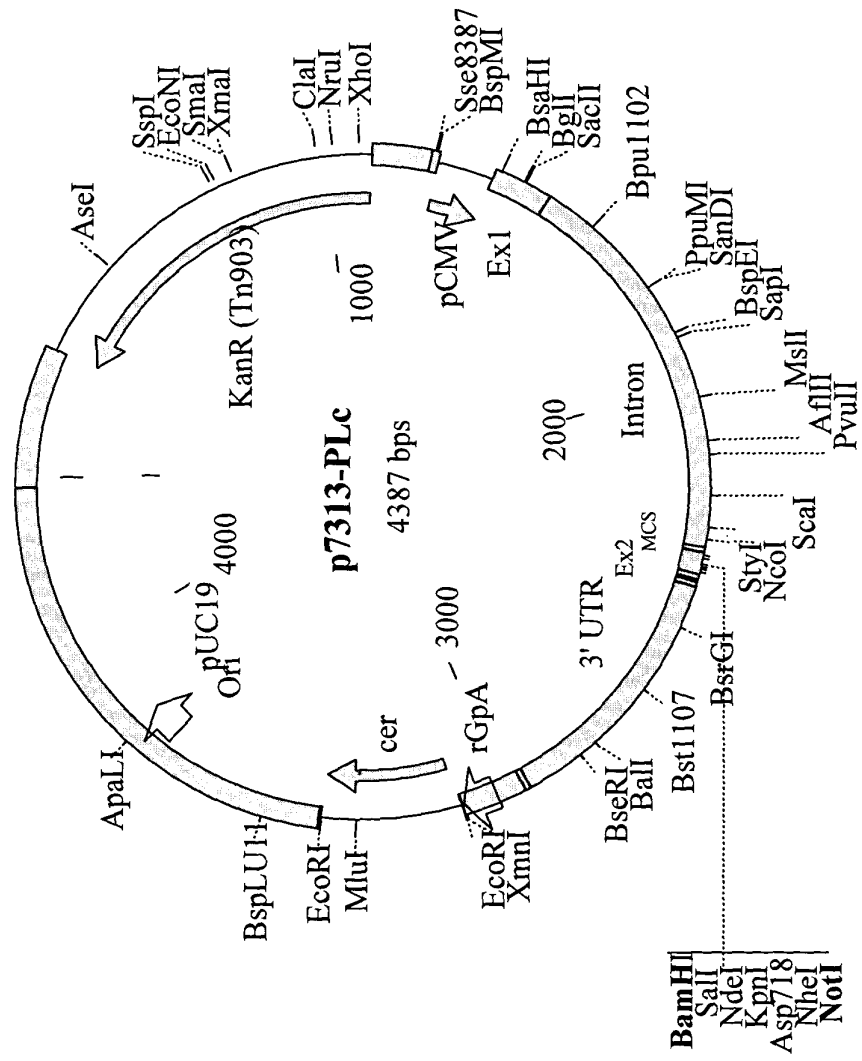
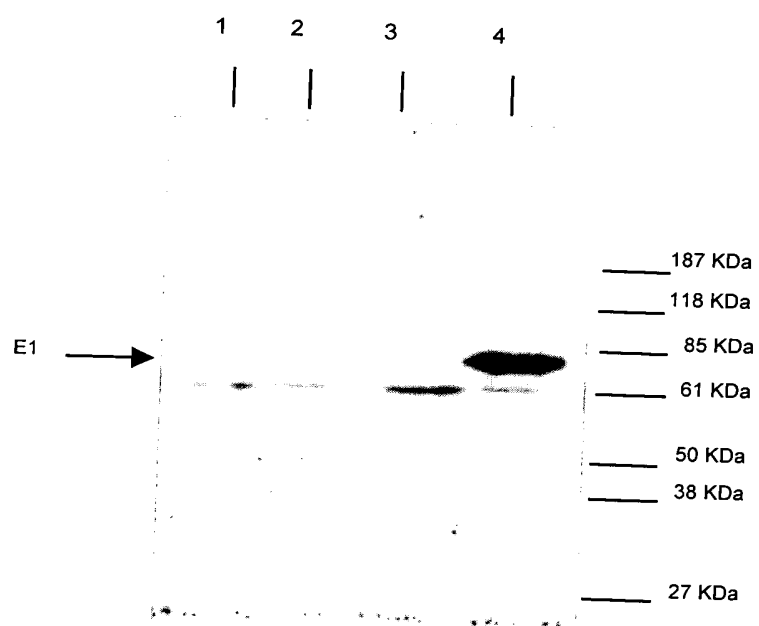


Fig. 8



Key :

- 1- 293T cell lysate control
- 2- p7313PLc vector control
- 3- p6bE1 w/t
- 4- p6bE1 c/o

Fig. 9

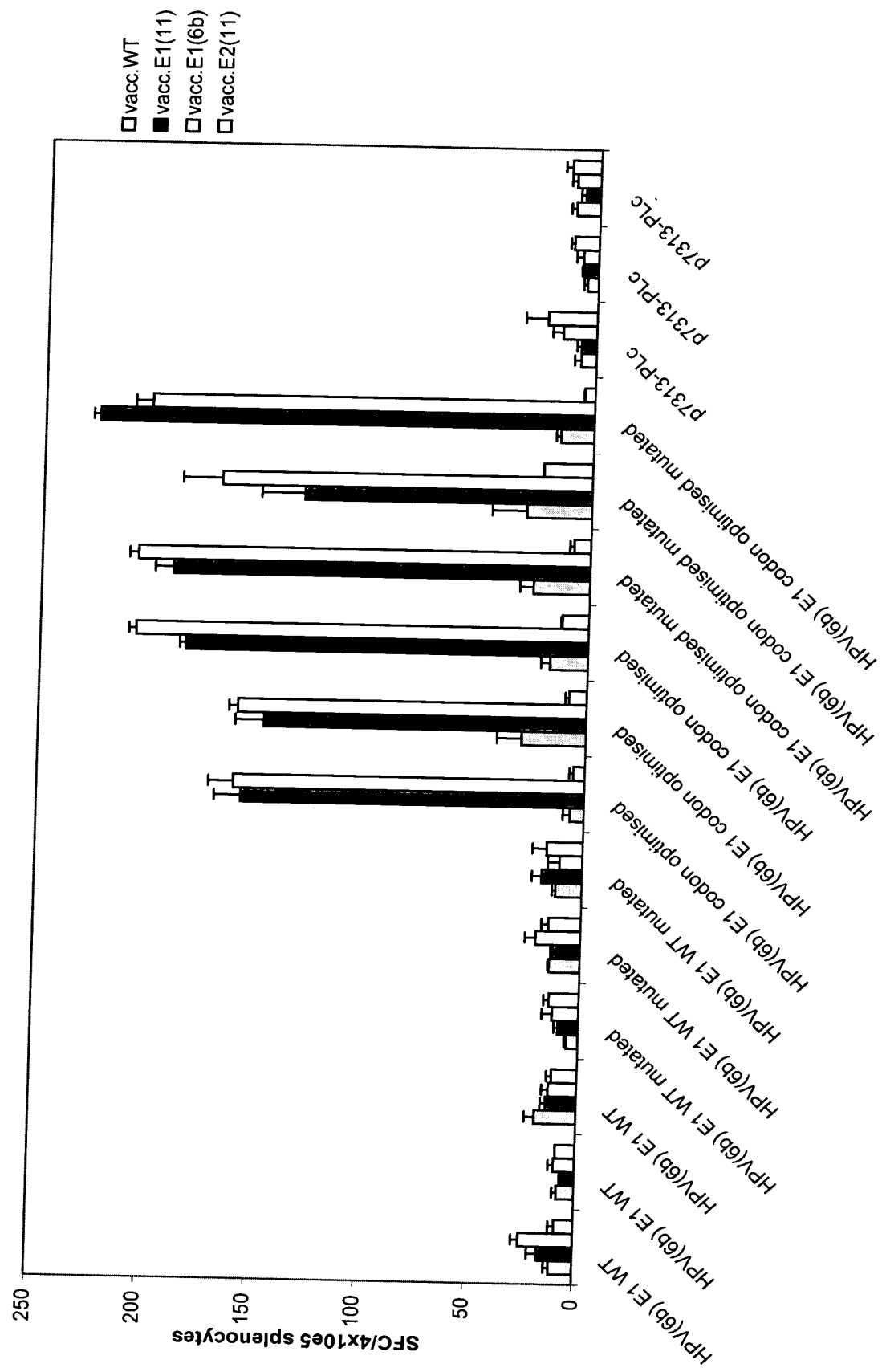
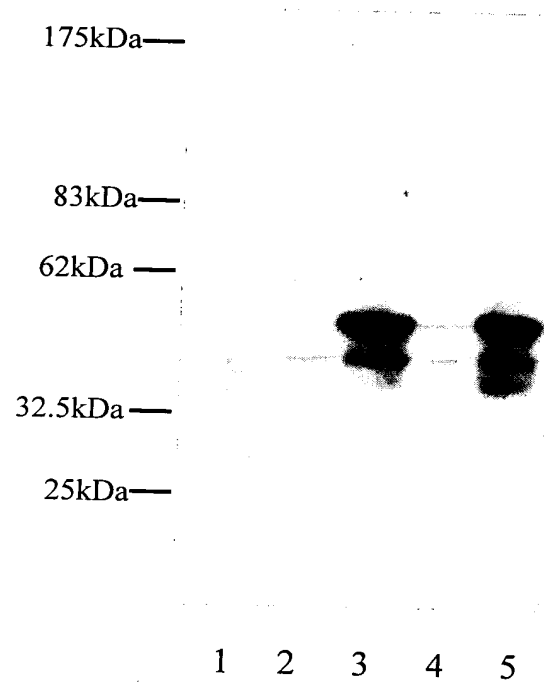


Fig. 10



- 1 p7313PLc
- 2 p6bE2 w/t
- 3 p6bE2 c/o
- 4 p6bE2 w/t mutated
- 5 p6bE2 c/o mutated

Fig. 11

Codon-optimised COPV E1 protects against Disease

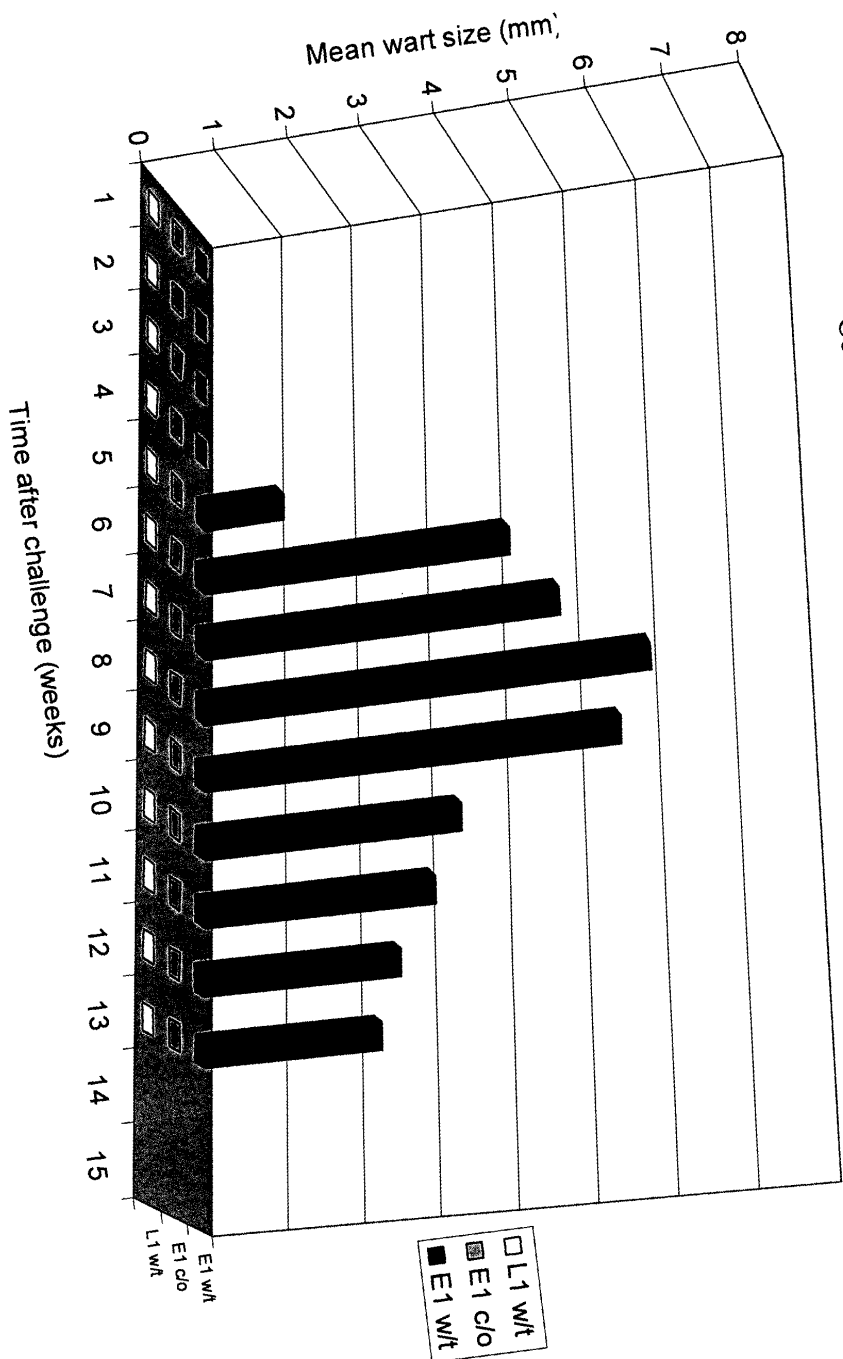


Fig. 12

Codon-optimisation of the COPV E1 gene significantly improves protein expression.

